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| 10/029,323 | 10/25/2001 | Peter Hagn | P01,0356 | 5549 |

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| EXAMINER |
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JAMAL, ALEXANDER

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| ART UNIT | PAPER NUMBER |
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2614

DATE MAILED: 05/11/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/029,323

Applicant(s)

HAGN, PETER

Examiner

Alexander Jamal

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 February 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-36 is/are pending in the application.
- 4a) Of the above claim(s) 3,4,20-22 and 24-27 is/are withdrawn from consideration.
- 5) ☐ Claim(s) 7,8,28 and 30 is/are allowed.
- 6) ☒ Claim(s) 1,2,5-19,23 and 28-36 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. Based upon the submitted amendment (2-27-2006), the examiner notes that claims 20-22 and 24 have been cancelled, and claim 36 has been added.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. **Claims 1,2,5,6,9-11,15-17,23,28,29,31-36** rejected under 35 U.S.C. 103(a) as being unpatentable over Hagstrom (6185434) and further in view of applicant's admitted prior art (specification page 2).

As per **claim 1**, Hagstrom discloses a front end for a multi-mode cell phone comprising RF switch elements 14,42,43 (Fig. 5, Col 5 lines 44-67). The system further comprises common antenna 21, mixed mode (a first transmission system) (GSM) filters 13a and 18a, and a DECT interface (a second transmission system) (pure mode TDD), and filters 13b and 18b. The filters are coupled to the common antenna via the switches 14 and 43. Additionally, Hagstrom discloses that the bandpass filters used in Hagstrom

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may be switchable bandpass filters (Col 7 lines 25-36). However, Hagstrom does not specify that the system comprises an additional pure FDD mode transmission interface or that the system comprises a multiple switch to couple all three transmission systems to the common antenna.

Hagstrom additionally discloses that the system is not limited to specifically one GSM (mixed mode) and one DECT mode, but may be implemented with other known dual mode apparatuses (Col 7 lines 9-26). Hagstrom additionally discloses that the system may be implemented with three transmission systems in parallel applied to the antenna filtering stage 51 (Col 7 lines 15-25). It would have been obvious to one of ordinary skill in the art at the time of this application to implement any number of parallel transmission systems with any combination of known band-pair signaling modes (GSM, FDD/TDD, DECT, pure FDD, or pure TDD), including the associated switching and multi-port filtering circuitry for the advantage of providing maximum compatibility with the system in which the phone is to be used.

Applicant's admitted prior art discloses that multiple switches may be used in known multi-band system in lieu of a diplexer (multi port filtering circuit) for the advantage that the system may implement standards whose frequencies are closer to (adjacent) to each other (applicant's specification page 2 lines 10-25). Hagstrom further discloses a deficiency in his system that the multiport filter only supports different signaling modes with sufficient separation. It would have been obvious to one of ordinary skill in the art at the time of this application to implement a multiple switch in

lieu of the multiport filter for the advantage of being able to support signaling modes whose frequency ranges are closer together.

Examiner further notes that 'multi-band' and 'multi-mode' interfaces are the same for the reason that, as far as the front end (such as Fig. 5 of Hagstrom) is concerned, the only difference in the transmission systems is the operating frequency range (all the signals are either switched or frequency filtered before being digitized). As such, the interface would treat a set of signaling standards in the same manner regardless of whether they belonged to a 'multi-band' or 'multi-mode' system ('bands' and 'modes' are just signaling standards defined by a frequency range).

As per **claims 31,36** claims rejected for the same reasons as claim 1, the multiswitching interface taught by applicant's admitted prior art will allow for adjacent or overlapping frequency ranges of the signaling protocols.

As per **claim 2**, Hagstrom discloses switches 14 and 43 in Fig. 5. However, Hagstrom does not disclose that the switches are implemented as diplexers.

Applicant's admitted prior art (applicant's specification page 2 lines 10-25) discloses that diplexers may be used to interconnect transmit/receive signals to a common antenna in an impedance-neutral fashion in the case where there is adequate separation between the frequency bands of said signals. It would have been obvious to one of ordinary skill in the art at the time of this application that diplexers could be implemented as the switches 14,43 in the case that there is adequate frequency band separation for the

advantage that the diplexer is impedance-neutral and as such, the signals will suffer less distortion (attenuation) when passing through the diplexer than they would in a non-impedance-neutral alternative.

As per **claim 5**, the system (Fig. 5) further comprises filter 13a which is a bandpass filter. A bandpass filter inherently (by definition) comprises the functionality of a high-pass filter and a low-pass filter.

As per **claim 6**, the system may comprise a diplexer that comprises an RF-switchable bandpass filter (Col 7 lines 25-36).

As per **claim 9**, Hagstrom discloses that the system may be implemented with additional parallel system (band pairs) operating DECT, GSM or any other compatible known signaling format (Col 7 lines 9-25).

As per **claims 10,11**, any additional band pairs would inherently comprise RF switches, duplexers, and diplexors for each band pair in the same manner described in Fig. 5 for the purpose of allowing the additional band pair to function as the band pairs of Fig. 5.

As per **claim 15**, the system may be implemented in a substrate with soldering pads (for discrete components), which is a printed circuit board (Col 6 lines 5-35).

As per **claims 16,17**, the system inherently comprises a DC drive for the purpose of providing power and bias to all the circuitry. The system further comprises a printed circuit board (common, multi-layer substrate) for the purpose of supporting and coupling

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(integrating) all the components of the circuit. The printed circuit board comprises partially planar structures (traces and vias and soldering pads) (Col 6 lines 6-35).

As per **claim 23**, claim rejected for same reasons as claim 1 rejection (switch 43).

As per **claim 29**, claim rejected for same reasons as claim 14 (listed below). The triplexer comprises a duplexor.

As per **claims 32-34** the claims are rejected for same reasons as claims 2 and 5.

As per **claim 35**, the claims are rejected for same reasons as claims 32-34.

Additionally, Hagstrom discloses switch 42. Examiner further notes that the switches 14 and 43 may be considered duplexers.

5. Claims 12-14 rejected under 35 U.S.C. 103(a) as being unpatentable over Hagstrom (6185434) as applied to claim 1 and further in view of Burgess (6459885).

As per **claims 12,13**, Hagstrom discloses applicant's claim 1 and the use of RF switches. However, Hagstrom does not specify what type(s) of switches are used.

Burgess discloses a radio transceiver switching circuit comprising RF switches made from GaAs FET transistors or PIN diodes with additional phase shifters (capacitors) (Col 1 lines 15-65). It would have been obvious to one skilled in the art at the time of this application that the switches could be made with GaAs FET transistors or PIN diodes for the purpose that they are well known switch implementations that are effective in RF mobile phones.

As per **claim 14**, claim rejected for same reasons as claim 12,13 rejections.

Additionally, Hagstrom discloses that the triplex filter (which may comprise RF filters and duplexers) may be implemented as stripline filters (Col 6 lines 25-35). Additionally, Fig. 5 of Hagstrom (as per the claim 1 rejection) discloses further filters 13a,13b,18a,18b and Fig. 4 of Hagstrom (as per claim 24 rejection) discloses filters 41 and 14a. However, Hagstrom in view of Burgess do not disclose specific components implemented 'independently' on individual substrates.

Examiner notes *Nerwin v. Erlichman*, 168 USPQ 177, 179 (PTO Bd. Of Int. 1969) that states that the mere fact that a given structure is integral does not preclude its consisting of various elements. Applicant has not provided any reasons or advantage of making any particular component independent from the other components in the system. It would have been obvious to one skilled in the art at the time of this application that components in a system could be implemented independently or dependently as a matter of design choice.

6. Claim 18 rejected under 35 U.S.C. 103(a) as being unpatentable over Hagstrom (6185434) as applied to claim 1 and further in view of Waldroup et al. (6070058).

As per **claim 18**, Hagstrom discloses applicant's claim 1 and power amplifiers on the transmission path (Fig. 5). However, Hagstrom does not specify that the system comprises a directional coupler to regulate the power amplifier.

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Waldroup discloses a radio transceiver comprising a directional coupler 50 (Fig. 1). Used to regulate a power amplifier (ABSTRACT). He teaches that this allows for a more efficient use of battery power (Col 1 lines 29-50). It would have been obvious to one skilled in the art at the time of this application to implement the additional power amp regulation for the purpose of conserving battery power.

7. **Claim 19** rejected under 35 U.S.C. 103(a) as being unpatentable over Hagstrom (6185434) as applied to claim 1 and further in view of Kurchuk et al. (6272327).

As per **claim 19**, Hagstrom discloses applicant's claim 1. However, Hagstrom does not specify that the system comprises a circulator arranged between the transmission amplifier and the antenna.

Kurchuk discloses a radio phone comprising circulator 350 (Fig. 6) (Col 9 lines 35-50). It would have been obvious to one skilled in the art at the time of this application to implement the circulator in Hagstrom's system for the purpose of protecting the transmitter from reflections.

Response to Arguments

8. Applicant's arguments filed (2-27-2006) have been fully considered but they are not persuasive.

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As per applicant's argument that Hagstrom teaches away from using a multiswitch in lieu of the triplexer because 'eliminating semiconductor switching components is advantageous in view of minimizing the energy consumption and the production costs' (remarks page 12). Examiner contends that applicant's admitted prior art and Hagstrom, teach a design tradeoff. It is extremely well known in the electronics and communications areas that there is usually fundamental tradeoff in performance versus cost of implementation. Applicant's admitted prior art discloses the advantages of using a multiswitch and applicant's arguments have indicated the advantage of using Hagstrom's disclosed triplexor. Examiner contends that one skilled in the art would be able to weigh both advantages and implement the appropriate triplexer or multiswitch depending on the specific application (ie. what frequency ranges, limiting costs are involved in the system being designed).

Allowable Subject Matter

9. Claims 7,8,28,30 are allowed over the prior art of record

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period

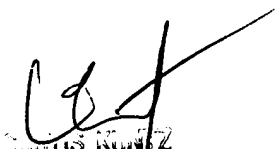
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will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alexander Jamal whose telephone number is 571-272-7498. The examiner can normally be reached on M-F 9AM-6PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Curtis A Kuntz can be reached on 571-272-7499. The fax phone numbers for the organization where this application or proceeding is assigned are **571-273-8300** for regular communications and **571-273-8300** for After Final communications.

AJ
May 9, 2006


CURTIS KUNTZ
PATENT EXAMINER
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